

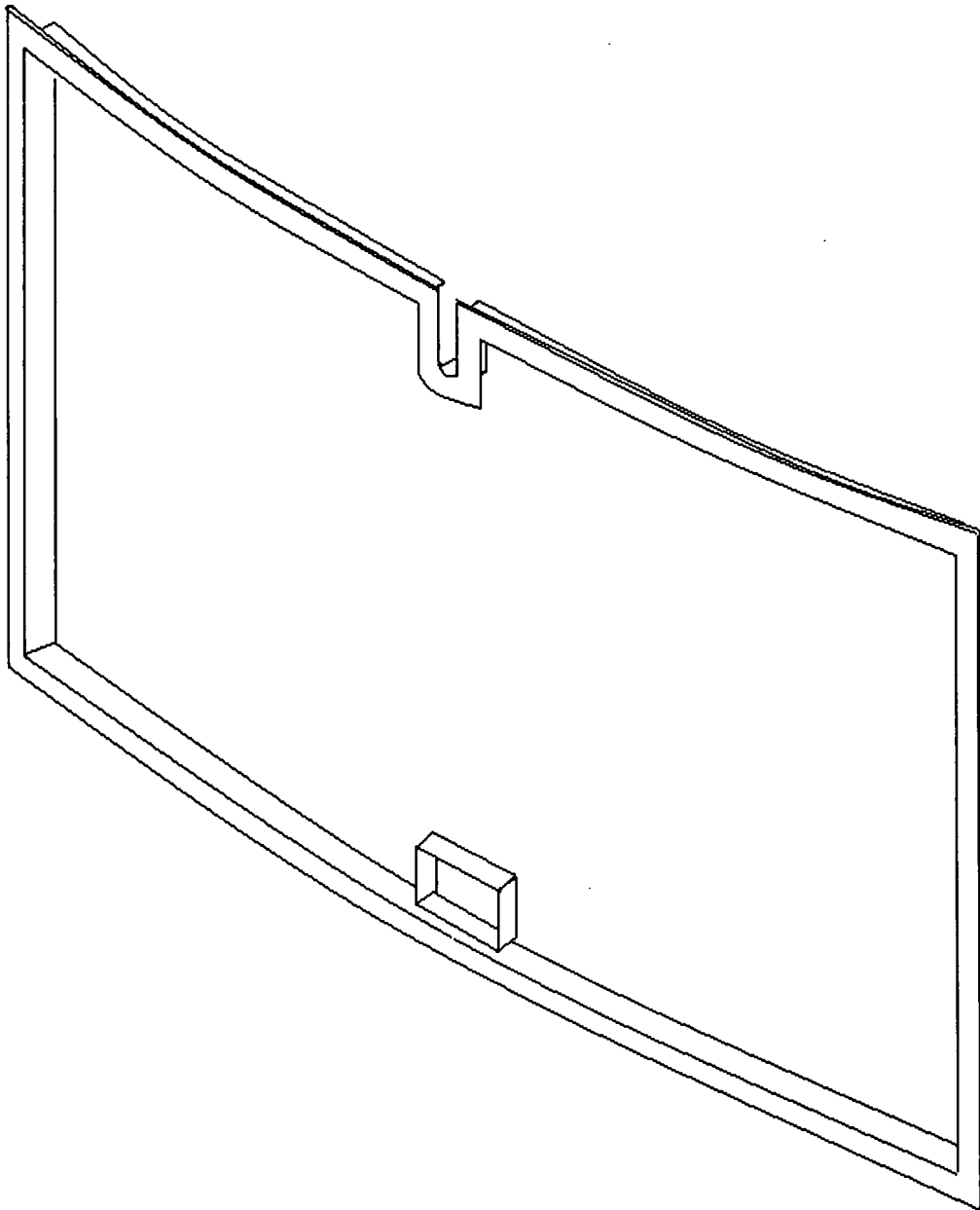
**Amendments to the Specification:**

Almost every paragraph has been modified in the original application specification; please replace each original paragraph with the amended one as listed below:

**THE WINDSHIELD HEATING AIR APPLIANCE**

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## CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable

U.S. Application Number: 10/761,504 (Title: Windshield Heating Air Appliance)

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### References Cited

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#### U.S. Patent Documents

<u>4786783</u>	<u>Nov., 1988</u>	<u>Woodard; Floyd E.</u>	<u>219/547</u>
<u>6155061</u>	<u>Dec., 2000</u>	<u>Davis, Jr., et al.</u>	<u>62/176.6</u>
<u>6598653</u>	<u>Jul., 2003</u>	<u>Gonzalez</u>	<u>160/370.21</u>
<u>6668917</u>	<u>Dec., 2003</u>	<u>Zeng; Xin</u>	<u>165/202</u>

## STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

## REFERENCE TO SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISK APPENDIX

Not Applicable

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

- [1] The present invention is directed to ~~prevent fogging of the windshield and to thaw accumulated ice on the windshield.~~ devices designed to accomplish the following:

- To prevent fogging of the automobile windshield.
- To enhance thawing of ice accumulated on the automobile windshield.
- To reduce fogging of the automobile front side windows.

### 2. Prior Art

- [2] ~~Driving an automobile in the wet or cold climate, the moisture from the driver and passenger breathing forms a foggy layer on the windshield inside the automobile;~~

~~which significantly reduces the driver visibility through the windshield and increases the risk of traffic accidents.~~ Fogging is caused by condensed water vapor collecting on a glass surface due to the difference in temperature between the glass surface and the adjacent air. Warmer air inside an automobile in contact with the windshield and side window surfaces will be cooled down, the cooling of this air reduces its ability to retain moisture, and thus the moisture that is released condenses on the inside of the windshield and side window surfaces. There are two different climate conditions in which fogging of the windshield and side windows occur even though the automobile has a ventilation system. First, in a cold climate, it occurs when the temperature inside the automobile differs significantly from the temperature outside. Secondly, in a wet climate such as a rainy day, it occurs when humidity inside the automobile is very high and the rain and wind keep the windshield and side windows cooler than air inside the automobile. When fogging of the windshield and side windows occurs, it significantly reduces the driver's visibility through the windshield and front side windows, greatly increasing the risk of traffic accidents. To address this issue, US patent 4786783 provides an electrically heated laminated windshield, and US patent 6668917 and 6155061 provide advanced HVAC systems. For average automobiles, the electrically heated laminated windshield is very expensive to produce, maintain and operate. The advanced HVAC systems that reduce fogging of the windshield are also too expensive for average automobiles.

- [3] Also, in a cold climate, an automobile cannot be operated until the ice accumulated on the windshield is melted and removed. ~~A fairly long time is required to preheat the automobile interior space and melt the ice.~~ To melt the ice, the time to preheat the automobile passenger compartment may be significant. To address this issue, US patent 6598653 provides a windshield cover to prevent ice accumulating. However, the windshield cover is easily stolen. Also, after its use, an iced windshield cover may not be stored right way.
- [4] Currently, there is ~~not known~~ a simple, economic approach that can effectively address the ~~driving safety concerns~~ related to fogging of the windshield and front side windows in a wet or cold climate. Also, ~~On the other hand, there is not a simple, economic and also no known~~ effective way to quickly melt the ice accumulated on the

windshield in a cold climate ~~to reduce the preheat time of the automobile interior space~~. Therefore, it is the objective of the present invention to create a simple and economic solution to address the above issues effectively so that the automobile industry will adapt the solution and make driving safer and easier in a wet or cold climate. The characteristics of the present invention will become apparent in light of the present specification, including claims, and drawings.

## BRIEF SUMMARY OF THE INVENTION

- [5] It is an object of ~~this the present~~ invention to ~~create a simple approach that prevents fogging of the windshield in a wet or cold climate and thereby to improve driving safety~~.
- [6] Another object of ~~this the present~~ invention is to speed up the melting of ice accumulated on the windshield ~~ice melting~~ in a cold climate so that an automobile can be operated soon after its engine warmed up ~~almost immediately~~.

[6.1] Still another objective of this invention is to reduce fogging of the front side windows in a wet or cold climate to enhance driving safety.

- [7] According to ~~this the present~~ invention, the windshield heating air appliance is made of transparent ~~plastic or other transparent materials~~ such as plastic as Figure 1 illustrates. The dashboard air vents cover (6) and flexible heated air supply male connector (1A) shown in Figure 4 are made of plastic. The windshield, and windshield heating air appliance together and the automobile dashboard form a complete assembly henceforth referred as the controlled windshield heating air space that is shown in Figure 9 ~~3~~. The controlled windshield heating air space can be quickly heated up through the heated air supply, the internal windshield surface can be and maintained at an optimal temperature to prevent fogging of the windshield in a wet or cold climate, or reducing the time required to melt the ice accumulated on the windshield in a wet or cold climate.

[7.1] According to this invention, the front side window cover is made of transparent materials such as plastic as Figure 10 and Figure 11 illustrate. Since air is a poor thermal

conductor, an additional insulation layer, formed by the front side window cover and air inside of the front side window cover, keeps the front side window cover temperature close to the internal automobile passenger compartment temperature. This effectively reduces fogging of the front side windows in a wet or cold climate.

[7.2] This invention has the following major advantages:

- It provides a single solution to address multiple issues, which include preventing fogging of the windshield, and reducing the time to melt ice accumulated on the windshield.
- The windshield heating air appliance and front side window covers are inexpensive.
- It does not occupy automobile passenger compartment usable room.
- Its installation is simple and easy.
- It reduces fogging of the front side windows.

#### BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

- [8] The foregoing summary and the following detailed description may be better understood when read in conjunction with the accompanying drawings. Various embodiments are shown for the purpose of illustrating the invention. It is understood, however, that this invention is not limited to the precise arrangements shown.
- [9] ~~Figure 1 shows a view from the outside of the automobile; Angle B of the dashboard support and the length of edges X and Y may vary based on size and position of the air vents. The windshield heating air appliance is attached to the windshield surface through the top, left, right and bottom T edges~~ an external view of the windshield heating air appliance with a heated air supply female connector (1) and a rear view mirror base path (2); its edges (3) are designed to be attached to the windshield surface.
- [10] ~~Figure 2 shows a view from the inside of the automobile; the dashboard support is attached to the dashboard surface~~ a passenger side view of the windshield heating air appliance.

- [11] ~~Figure 3 shows a view from the outside of the automobile; the dashboard is shown at the bottom~~ the windshield represented by thin dashed lines (4), and the windshield heating air appliance together form the controlled windshield heating air space, which is less than 1% of the entire automobile passenger compartment.
- [12] ~~Figure 4 shows a view from the inside of the automobile; the dashboard is shown at the bottom~~ an external view of the dashboard windshield air vents cover (6) with a flexible heated air supply male connector (1A). This male connector joins the heated air supply female connector (1) of the windshield heating air appliance to supply heated air for the controlled windshield heating air space. Automobile dashboard windshield air vents (5) may be different in shape or location on its dashboard (7), so may the related dashboard windshield air vents cover (6) be different.
- [13] ~~Figure 5 shows a view from the outside of the automobile; the dashboard and the air vents are shown at the bottom~~ an external view of the dashboard (7) equipped with a separate windshield heated air supply outlet (8) that replaces the existing dashboard windshield air vents.
- [14] ~~Figure 6 shows a view from the outside of the automobile; the dashboard and the air vents are shown at the bottom~~ an external view of the separate dashboard windshield heated air supply outlet (8) fixed with a flexible heated air supply male connector (1B). This male connector joins the heated air supply female connector (1) of the windshield heating air appliance to supply heated air for the controlled windshield heating air space.
- [15] ~~Figure 7 shows shaded surfaces of the windshield heating air appliance are designed to attach to the windshield surface~~ a windshield heating air appliance edge design; a partial edge of the windshield heating air appliance, the male buttons (10) are attached to the windshield surface, and female buttons (9) are part of the windshield heating air appliance edge.
- [16] ~~Figure 8 shows the bottom surface of the shaded portion is designed to attach to the dashboard surface~~ the partial windshield heating air appliance edge attached to the windshield by locking its female buttons (9) with male buttons (10) that are fixed on the windshield surface. The foam layer (11) seals the gap between the windshield heating air appliance edge and the windshield surface.

- [17] Figure 9 shows that the windshield surface is represented by the solid thick line; the windshield heating air appliance surfaces are represented by the dashed line; the dashboard surface is represented by hatched lines at the bottom of the figure; this completes the assembly referred as the "controlled heating air space", which consumes less than 5% of the entire automobile interior space a view of the windshield heating air appliance comprised of two symmetric parts to facilitate shipping.
- [18] Figure 10 shows that a plastic windshield sunglass device is shown in A; the plastic windshield sunglass is attached to a hard handle on the right as shown in B; two handle holders attached to the windshield heating air appliance shown in C are used to lock the plastic windshield sunglass handle a view of the front side window cover.
- [19] Figure 11 shows another type of plastic windshield sunglass that has a series holes located around its edges through which the plastic windshield sunglass is mounted on the windshield heating air appliance an isometric view of the front side window cover.
- [20] Figure 12 shows a windshield heating air appliance with two plastic windshield sunglass devices; two shaded surfaces represent two plastic windshield sunglasses pulled out from the two plastic sunglass devices edge sizes of the front side window cover.
- [21] Figure 13 shows a windshield heating air appliance with a series transparent plastic hollow columns that are mounts for installing plastic windshield sunglasses as shown in Figure 11.
- [22] Figure 14 shows a windshield heating air appliance with two plastic sunglasses shown as shaded surfaces.
- [23] Figure 15 shows a view from the outside of the automobile; adjustable windshield rear view mirror base holes are shown on the top.
- [24] Figure 16 shows a view from the inside of the automobile, adjustable windshield rear view mirror base holes are shown on the top.
- [25] Figure 17 shows a left view from the outside of the automobile.
- [26] Figure 18 shows a different left view from the outside of the automobile.
- [27] Figure 19 shows an automobile windshield heating air appliance related T edge sizes where the height is 1.5 inches and the width is 1.0 inches; the dashboard support edge size is 0.8 inches wide

## DETAILED DESCRIPTION OF THE INVENTION

[28] According to ~~the present~~ this invention, the windshield heating air appliance is made of the transparent ~~plastic or other transparent materials~~ such as plastic that are unbreakable during an automobile crash. The top, left, right and bottom T edges of the windshield heating air appliance are designed to attached to the windshield as shown in the shaded surfaces of Figure 7. The dashboard support edge is designed to attach to the dashboard as shown by the shaded surface in Figure 8. Figure 19 illustrates the dimensions of the T edge to be 1.5 inches tall and 1.0 inches wide and dashboard support edge to be 0.8 inches wide. Figure 5 and Figure 6 show the dashboard air vents are located between the windshield and the windshield heating air appliance the windshield heating air appliance edges are designed to be attached to the windshield by locking its windshield edge female buttons (9) with male buttons (10) that are fixed to the windshield surface. The windshield and the windshield heating air appliance ~~and the automobile dashboard~~ together form a complete assembly henceforth referred as the controlled windshield heating air space. Using heated air supply from either dashboard windshield air vents (5) or a separate windshield heated air supply outlet (8), where the controlled heating air space can be quickly heated up and the internal windshield surface can be maintained at an optimal temperature; thus the heated internal windshield surface no longer allows the adjacent air to transfer moisture, which prevents fogging of windshield. using the hot air supply from the dashboard air vents. Thus the moisture from the passenger breathing can no longer form a foggy layer on heated windshield and windshield heating air appliance. This ensures the best driver driving visibility in a wet or cold climate.

[28.1] Furthermore, the controlled windshield heating air space can maintain the windshield surface at a relatively high temperature in a very cold climate, this can prevent the windshield from a dangerous "flash freeze" situation which may occur when water at or near freezing point strikes a relatively cool windshield while it is in motion, such as when cold water is splashed up onto a car windshield by a passing tractor-trailer.



- [29] When an automobile is parked in a parking lot or on the street in a cold climate, the normal practice to remove ~~melt~~ ice accumulated on the windshield is to preheat the automobile passenger compartment. ~~interior space which takes fairly long time.~~ Since the controlled windshield heating air space ~~consumes~~ is less than 1.5% of an automobile passenger compartment. ~~interior space,~~ it takes much less time to heat up the controlled windshield heating air space compared to the entire automobile ~~interior space-passenger compartment;~~ thus, it takes much a shorter time to heat up the windshield, melt the ice accumulated on the windshield, ~~saves energy~~ and reduces pollution.
- [30] ~~The large soft plastic windshield sunglass is another feature of the windshield heating air appliance. A rotatable plastic sunglass device as shown in Figure 10 is designed for simplicity. To use the plastic windshield sunglass when driving on a sunny day, just pull out the plastic windshield sunglass hard handle and lock the hard handle into the two handle holders on the windshield heating air appliance as shown in Figure 12. To put away the sunglass before driving when sunny conditions are not present, just release the hard handle from the handle holders, the rotatable plastic sunglass device automatically rotates the plastic windshield sunglass out of view.~~
- [31] ~~Another plastic windshield sunglass design is shown in Figure 11. Each plastic windshield sunglass has a series holes spreading on its edges, the windshield heating air appliance has a series hollow columns as shown in Figure 13. The columns are used as mounts for corresponding plastic windshield sunglasses. Figure 12 shows the windshield heating air appliance with plastic windshield sunglasses.~~
- [32] Some automobile models have the rear view mirror base attached to the ceiling. Others automobiles have the rear view mirror base attached to the windshield. To accommodate the need for ~~handle the case where~~ the rear view mirror base is attached to the windshield, the windshield heating air appliance ~~could be cut~~ has an open path (2) shown in Figure 1 and Figure 2 to fit ~~accommodate~~ the rear view mirror base as shown in ~~Figure 15 and Figure 16.~~

[32.1] According to this invention, the front side window cover is made of transparent materials such as plastic. Since air is a poor thermal conductor, the air temperature

between the front side window and the front side window cover is always higher than the front side window temperature in a wet or cold climate. An additional insulation layer, formed by the front side window cover and air inside the front side window cover, enhances the front side window insulation, thus keeping the front side window cover temperature close to the inside passenger compartment temperature. This significantly reduces fogging of the front side window in a wet or cold climate.